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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,732	09/11/2000	Makoto Inai	P/1071-1118	4527

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OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER

BAUMEISTER, BRADLEY W

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 12/05/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/658,732

Applicant(s)

INAI et al.

Examiner

BAUMEISTER

Group Art Unit

2815

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 5/15/01.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☐ Claim(s) 1-10 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☐ Claim(s) 1-10 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____.

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 4,5
- ☒ Notice of References Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 6 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawada et al., "A Super Low-Noise [DC-HFET]" (supplied by Applicant in IDS paper #4). Sawada discloses a DC-HFET having an n-InGaAs channel, n-AlGaAs barrier, n-GaAs contact, ohmic S/D contacts and a Schottky gate. The channel/barrier and barrier/contact junctions are isotype heterojunctions.
4. Claims 1, 2, 4, 6, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawada et al. '032. Sawada discloses (see e.g., FIG 4) a DC-HFET having an n-doped channel (layer 22), n-AlGaAs barrier (LAYER 5) and n-GaAs contact (layer 6), ohmic S/D contacts and a

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Schottky gate. The channel/barrier and barrier/contact junctions are isotype heterojunctions.

Regarding claim 8, TABLE 4 at col. 11 discloses that the doped channel (3rd semiconductor layer) may be composed of InGaAs.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Sawada et al, Super Low-Noise DC-HFET or alternatively Sawada '032 as applied to the claims above. Each of the Sawada references discloses the general condition that the channel, barrier (semiconductor) and contact layers are all heavily doped (above $1 \times 10^{18} \text{ cm}^{-3}$) n-type isotype heterojunctions, but neither reference teaches that the doping concentrations of all three layers forming the two junctions are specifically $1 \times 10^{18} \text{ cm}^{-3}$. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to dope each of the layers to $1 \times 10^{18} \text{ cm}^{-3}$ since the specific doping levels do not provide any critical or unexpected results and it has been held that where the general conditions of a claim are disclosed in the prior art,

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discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

INFORMATION ON HOW TO CONTACT THE USPTO

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, **B. William Baumeister**, at (703) 306-9165. The examiner can normally be reached Monday through Friday, 8:30 a.m. to 5:00 p.m. If the Examiner is not available, the Examiner's supervisor, Mr. Eddie Lee, can be reached at (703) 308-1690. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

B. William Baumeister

November 27, 2001



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800